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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/590,962 | 08/29/2006 | Frank Arndt | 4001-1227 | 5638 |

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| EXAMINER | |
|---|---|
| ROSENAU, DEREK JOHN | |
| **ART UNIT** | **PAPER NUMBER** |
| 2834 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/590,962 | ARNDT ET AL. | |
| | Examiner | Art Unit | |
| | Derek J. Rosenau | 2834 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *29 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/29/06 12/1/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 26. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

**Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A

COMPACT DISC.

(f) BACKGROUND OF THE INVENTION.

(1) Field of the Invention.

(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.

(g) BRIEF SUMMARY OF THE INVENTION.

(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(i) DETAILED DESCRIPTION OF THE INVENTION.

(j) CLAIM OR CLAIMS (commencing on a separate sheet).

(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 5, 6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lardiere et al. (US 4982121) in view of Pei et al. (US 2004/0263028).

4. With respect to claim 1, Lardiere et al. discloses a cladding (Figs 5 and 6) with an elastic boundary layer (items 26) which forms the surface of the cladding (Figs 5 and 6), characterized in that the cladding bears on the cladded substrate (Fig 5) by means of a bearing area which matches the surface area of the cladding in terms of magnitude (Fig 5), with only subregions of the bearing area being fixed to the substrate (Figs 5 and 6).

Lardiere et al. does not disclose expressly that a polymer actuator is integrated in the cladding for the deformation of the boundary layer.

Pei et al. teaches a cladding with an elastic boundary layer in which a polymer actuator (Paragraph 114) is integrated in the cladding for the deformation of the boundary layer (Fig 1E).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the polymer actuator of Pei et al. with the device of Lardiere et al. for the benefit of the improved efficiency of polymer actuators (Paragraph 16 of Pei et al.).

5. With respect to claim 2, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 1. Lardiere et al. discloses that the actuator is in the form of a membrane actuator (Figs 5 and 6). Pei et al. discloses that the polymer actuator is in the form of a membrane actuator (Fig 1E).

6. With respect to claim 3, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 2. Lardiere et al. discloses that the cladding is fixed to the substrate at regular intervals in a punctiform manner (Fig 5 and 6).

7. With respect to claim 5, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 1. Lardiere et al. discloses that the cladding is composed of individual lamellae which are each fixed to the substrate by means of one end, with the lamellae each being polymer actuators in the form of bending actuators (Figs 5 and 6).

8. With respect to claim 6, Lardiere et al. discloses a cladding (Figs 5 and 6) with an elastic boundary layer (items 26) which forms the surface of the cladding (Figs 5 and 6), characterized in that the cladding bears on the cladded substrate (Fig 5) by means of a

bearing area which matches the surface area of the cladding in terms of magnitude (Fig 5), with the cladding being firmly connected to the substrate by means of the entire bearing area (Figs 5 and 6) and having at least one electrode layer (item 13) for the actuator, which electrode layer extends only over a subregion of the polymer actuator (Figs 5 and 6).

Lardiere et al. does not disclose expressly that a polymer actuator is integrated in the cladding for the deformation of the boundary layer.

Pei et al. teaches a cladding with an elastic boundary layer in which a polymer actuator (Paragraph 114) is integrated in the cladding for the deformation of the boundary layer (Fig 1E).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the polymer actuator of Pei et al. with the device of Lardiere et al. for the benefit of the improved efficiency of polymer actuators (Paragraph 16 of Pei et al.).

9. With respect to claim 8, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 6. Lardiere et al. discloses that the substrate forms an electrode for the actuator (Figs 5 and 6, item 14). In combination with Pei et al., it would form an actuator for the polymer layer of the polymer actuator.

10. With respect to claim 9, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 1. Lardiere et al. discloses that the boundary layer is in the form of an auxiliary layer (item 26) on the actuator (Figs 5 and 6).

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lardiere et al. in view of Pei et al. and Zalalutdinov et al. (US 2006/0239635).

12. With respect to claim 4, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 1.

Neither Lardiere et al. nor Pei et al. discloses expressly that the cladding is provided with though-holes.

Zalalutdinov et al. teaches a cladding device actuated by a piezoelectric element in which a through-hole (item 135) is provided in the cladding.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the hole of Zalalutdinov et al. with the device of Lardiere et al. as modified by Pei et al. for the benefit of reduced weight.

13. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lardiere et al. in view of Pei et al. and Kihara et al. (US 2002/0043901).

14. With respect to claim 7, the combination of Lardiere et al. and Pei et al. discloses the cladding as claimed in claim 6.

Neither Lardiere et al. nor Pei et al. discloses expressly that the electrode layer forms the webs of a honeycomb-like structure on the polymer layer.

Kihara et al. teaches a piezoelectric device in which the electrode is in the form of the webs of a honey-comb-like structure (Fig 8D).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the honeycomb-like electrode of Kihara et al. with either or both of

the electrodes of Lardiere et al. for the benefit of allowing for easy fabrication (Paragraph 85 of Kihara et al.).

15. With respect to claim 10, the combination of Lardiere et al., Pei et al., and Kihara et al. discloses the cladding as claimed in claim 7. Lardiere et al. discloses that the substrate forms an electrode (item 14) for the actuator. In combination with Pei et al., it would form an actuator for the polymer layer of the polymer actuator.

***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bernstein (US 6222304) discloses a cladding with a boundary layer which forms the surface of the cladding, and a piezoelectric actuator integrated into the cladding of the deformation of the boundary layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek J. Rosenau whose telephone number is (571)272-8932. The examiner can normally be reached on Monday thru Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Derek J Rosenau
Examiner
Art Unit 2834

/D. J. R./
Examiner, Art Unit 2834

/Darren Schuberg/
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